

STATE OF MONTANA

JOB DESCRIPTION

Montana state government is an equal opportunity employer. The State shall, upon request, provide reasonable accommodations to otherwise qualified individuals with disabilities.

Job Title: Materials Lab Specialist

Position Number: 40044

Location: Helena

Department: Transportation

Division and Bureau: Highways and Engineering, Materials Bureau

Section and Unit: Physical Testing

Job Overview:

This position serves as a Materials Laboratory Specialist for the Physical Testing Section of the MDT Materials Bureau. The position is responsible for directing various materials testing processes to ensure the quality, consistency, and efficiency of materials lab operations, to ensure that materials comply with specifications, and to provide information and consultation for the development and application of materials and planning and conducting materials testing and analysis projects. The position is also responsible for the accuracy and consistency of testing and results for the cement, concrete, and soils materials laboratory's in the Physical Testing Section. The position reports to the Concrete/Aggregate Supervisor.

Essential Functions (Major Duties or Responsibilities):

Materials Testing Oversight 50%

Under the direction/supervision of the Concrete/Aggregate Supervisor Assess and Coordinate various materials testing processes to ensure the quality, consistency, and efficiency of materials lab operations, to ensure that materials comply with specifications, and to provide information and consultation for the development and application of materials.

1. Coordinate the development, refinement, and implementation of new test procedures and processes including testing for acceptance with contract quality control and assurance requirements, testing for suitability of materials on proposed programs or projects, and testing for research purposes. This involves practical application of new testing methods and equipment, providing recommendations

on the feasibility of new applications, and assisting in documenting test procedures. This also requires research into, and practical application of the principles of materials testing, industry standards and processes, and standardized testing procedures and protocols; and determining how national standards and protocols apply to MDT operations and unique State of Montana materials testing requirements.

2. Develop, implement, and monitor procedures, manuals, and guidelines related to the MDT's Physical Testing Program based upon assessment of daily materials testing needs and operations, professional testing and analysis methods and standards, and Division policies. This involves assessing changes affecting testing protocols and requirements (e.g., updating the cement procedures, implementing new concrete class protocols, modifying receiving and testing sequences to produce results more quickly, etc.); incorporating objectives from the Materials Lab Specialist, Unit Supervisor, and Section Supervisor; evaluating, interpreting, incorporating new testing and documentation methods; and monitoring the ongoing effectiveness of materials lab operations to recommend new approaches to testing and reporting protocols.
3. Assess incoming testing assignments (e.g., soils, cement, concrete, aggregate, etc.) to determine priority based on factors such as contract requirements, project needs, length of time for testing processes, and staff and supply resources. This includes determining staff assignments based on individual capabilities, certifications and qualifications, and testing requirements. Interpret, monitor, and implement work plans, policies, and procedures. Review assigned work for compliance with quality, quantity, and other standards. Research and evaluate workflow processes, efficiencies, and problems to identify the most effective use of human and fiscal resources to meet section goals and project objectives. Present recommendations for improving section work flow and staff performance. Determine the need for additional staff or overtime, fill in for absent staff on testing procedures, and adapt testing procedures and work assignments to meet changing demands in the lab.
4. Coordinate with unit supervisors and Materials Lab Specialists involved with other testing activities to identify and resolve common problems; evaluate and determine resource allocations and priorities; and incorporate section-wide priorities and equipment into specific testing projects.
5. Provide technical oversight, quality assurance reviews, and assistance on specific testing projects to ensure the quality, efficiency, and cost-effectiveness of work as well as compliance with standards, specifications, and Department requirements. This includes reviewing project documentation and reported discrepancies, resolving problems, and providing on-the-job training. Coordinate with section and unit supervisors to integrate new procedures, specifications, equipment, and other changes with ongoing materials lab operations.
6. Interpret and explain standards, specifications, and other requirements to materials lab staff, field and district staff, and contractors to ensure consistency and compliance, resolve discrepancies, and ensure that project requirements and objectives are met. Respond to project staff or contractor requests for clarification, recommend adjustments and alternatives to prevent or mitigate compliance deficiencies, and resolve problems while maintaining standards and specifications.
7. Coordinate and oversee inspections of testing equipment to ensure operability and proper calibration according to defined testing methods and specifications. Oversee equipment calibrations, replacements, and repairs and resolve advanced technical and mechanical problems referred by materials laboratory staff. Establish timeframes for verification and calibration based on manufacturer, AASHTO, and internal protocols.

8. Coordinate and oversee sample preparation, labeling, and documentation according to State and federal requirements. Ensure materials were properly transported, received, and labeled; and monitor sample preparation, assess the adequacy of samples, and determine necessary adjustments based on testing methods, equipment, standards, and specifications.
9. Coordinate and oversee quality control and assurance of testing methods to ensure the accuracy of methods, refine procedures, and ensure compliance with applicable requirements including coordination of ACI lab certifications and AASHTO ReSource and CCRL accreditation. This includes ensuring tests are being performed properly, coordinating or performing split testing and other independent assurance activities, acquiring and maintaining all necessary certifications to perform job duties, and ensuring staff have the appropriate experience or certifications for the tests they are running, etc.
10. Determine the training needs of unit staff through analysis of program effectiveness, new methods and policies, and staff performance. Provide or coordinate formal and on-the-job training to ensure that current physical testing methods and equipment are properly applied by unit staff. Ensure consistency in the application of training opportunities for staff and that Unit personnel are properly monitored and trained.
11. Provide input to the Unit and Section Supervisors on position descriptions and performance standards. Relay information to the Supervisor regarding staff performance based on observable, measurable appraisal standards. Recommend, implement, and monitor corrective actions. Participate in recruitment and selection by assisting the Supervisor in screening applicants, establishing questions for the structured interview, participating in interviews, and recommending hiring.
12. Oversee adherence to the Unit's safety plan to ensure the safety of Department staff performing work in the Materials Lab and compliance with department, state, and federal occupational safety and health requirements. This involves ongoing development, modification, and monitoring of unique safety and emergency/injury response plans to accommodate specific Unit procedures (e.g., work with caustic materials, hazardous equipment, etc.) Monitor work of unit staff to identify and resolve hazards.

Testing Operations 45%

This position performs a range of duties in support of material testing and evaluation including coordinating and implementing the physical and chemical testing of cement and pozzolans; batching, mixing, and testing of concrete mixtures; compiling and analyzing concrete mix component test results; conducting calculations to ensure compliance with yield, quality, durability, and other specifications requirements; performing special investigations, trouble shooting, research, and quality assurance analysis. The position also oversees and performs a range of duties in support of soil, aggregate, fabric, and Cement Treated Base (CTB) material testing and evaluation including coordinating and implementing soils testing procedures, aggregate testing procedures, geosynthetics testing procedures, and CTB mix design verification and testing procedures.

1. Coordinate, oversee, and conduct specialized physical and chemical tests on cement and pozzolans to verify specifications and adherence to the Qualified Products List (QPL) requirements. This involves the application of detailed testing procedures (e.g., Fineness, chemical analysis, autoclave expansion, initial and final set, normal consistency, etc.) to determine the compliance and other characteristics of the materials; determining whether deficient results are due to substandard features or materials, malfunctioning equipment, or operator error; and determining the need for further sampling, testing,

and/or split sample analyses as appropriate. This may include communication with manufactures/producers to cross examine results from a specific mill grind to determine where a deficiency occurred (e.g., silo, transport, ready-mix plant, etc.). Investigate the nature and cause of significant or recurring deficiencies and coordinate with other project supervisors and materials lab specialists to resolve problems.

2. Coordinate, oversee, and conduct specialized tests on concrete materials to verify specifications and determine the specific nature and cause of deficiencies. This involves the application of detailed testing procedures (e.g., aggregate testing, slump, air content, strength, permeability, shrinkage, etc.) to determine the compliance and other characteristics of materials; determining whether deficient results are due to substandard features or materials, malfunctioning equipment, or operator error; and determining the need for further sampling, testing, and/or split sample analyses as appropriate. This may include duplicating a deficiency in a controlled laboratory setting by collecting adequate sample volumes to batch, mix, and test specific contractor mix designs in the fresh and hardened state. Investigate the nature and cause of significant or recurring deficiencies and coordinate with other project supervisors and materials lab specialists to resolve problems.
3. Coordinate, oversee, and conduct specialized tests on soils, aggregates, geosynthetics, and CTB samples to verify specifications and determine the specific nature and cause of deficiencies. This involves the application of detailed testing procedures (e.g., proctors, R-values, strengths, fabrics, gradations, sodium sulfates, micro devals, etc.) to determine the compliance and other characteristics of the materials; determining whether deficient results are due to substandard features or materials, malfunctioning equipment, or operator error; and determining the need for further sampling, testing, and/or split sample analyses as appropriate. Investigate the nature and cause of significant or recurring deficiencies and coordinate with other project supervisors and materials lab specialists to resolve problems.
4. Compile, calculate, and summarize test results; compare final results to specifications; and maintain records of testing procedures and results. This involves the application of conversion factors, tables, and algebraic equations; noting deviations from standard specifications; and identifying deficient test results. Review and approve test results compiled by subordinate materials lab technicians to ensure accuracy and compliance with standards and specifications.
5. Enter information in the computer including performing mathematical calculations and completing data sheets. Conduct computer analysis of results to determine materials compliance by comparing with established standards in the project specifications. Each standard involves a range of acceptability, and the position considers all standards concurrently to determine overall acceptability of the sample. The position must determine the proper forms/information required based on the nature of the sample and project. Accuracy is crucial in testing and recording activities as this information will be used by design staff to determine the potential of concrete materials, and by the supervisor and project manager to determine the acceptability of materials, which has a significant economic impact on the contractor and on the quality of roadways.
6. Analyze data to discern discrepancies and provide recommendations on mix design or other materials alterations. For example, this may involve correlating compressive strength test results with other tests (e.g., gradations and air content) to determine relationships between factors such as admixtures, gradations, cement content, slump, permeability. Materials (e.g., a mix design) that are not meeting established criteria could be the result of a combination of many variables including incorrect temperatures, contaminated materials, improper gradations, unique cement/pozzolan

properties, and admixtures used. The position will report non-typical sample data to the supervisor along with recommendations as to the cause of results.

7. Communicate test results and provide technical assistance to field staff and district labs. This involves exchanging information regarding mix designs, conflicting test results, and technical testing methods and procedures.
8. Maintain and repair laboratory testing equipment to ensure safety, accurate results, proper operation, cost containment, and extended life. This involves a variety of processes including routine maintenance, lubricating equipment, checking for specifications and tolerances, replacing worn or damaged parts, and determining the condition of equipment and need for repair or replacement. Ensure all equipment is calibrated and operating properly, re-calibrate or verify equipment as needed, and make necessary adjustments to equipment to ensure it is within specifications and accurate.
9. Determine and fulfill equipment and supply procurement needs of the Unit. This involves monitoring supply levels, projecting needs based on work load and project plans, preparing order forms, and integrating equipment into existing operational practices to ensure maximization of resources. The position will make recommendations to the supervisor on the need for new equipment based on observations during operation and maintenance activities including responsibility for developing specifications and recommending budget justifications and requests.

Other Duties as Assigned 5%

Perform a variety of special studies, research and analysis activities, facilitate additional testing as directed, and other duties as assigned by the supervisor and bureau chief in support of the department mission and bureau objectives. This includes filling in for co-workers; exchanging information with contractors, agency staff, and the public; providing training, education, and professional and technical assistance; directing special projects; and attending ongoing education and training as directed.

Supervision

If this incumbent supervises others, please list each employee supervised and the position number:

The number of employees supervised is: 0

The position number for each supervised employee is: n/a

Physical and Environmental Demands:

List physical aspects of the job, including frequency and duration, and environmental factors an incumbent can expect in this position. You may also access the State of Montana Safety Program, the Return to Work Program, and other Resources.

PHYSICAL

- Heavy independent lifting (up to 75 lbs.) of equipment, material samples, etc. Remaining standing or seated for extended periods of time
- Manual manipulation of testing equipment (shakers, compaction devices, sieves, etc.)
- Visual acuity required to observe and discern material and sample conditions Operating a personal computer
- Communicate in writing, in person, and over the phone

MENTAL

- Ability to multi-task
- Ability to work independently
- Ability to problem solve
- Demands for accuracy in all aspects of work
- Ability to meet inflexible deadlines
- Computing arithmetic operations
- Comparing data
- Compiling information
- Analyzing
- Coordinating
- Instructing/training

Knowledge, Skills and Abilities (Behaviors):

KNOWLEDGE:

This position requires knowledge of materials inspection and testing principles and practices; the properties and characteristics of a variety of materials; laboratory testing protocols and procedures; highway construction methods and techniques, a variety of site specific circumstances and their impacts (soils, temperature, weather conditions, gradations, segregation, air contents, slumps, admixtures, absorption rates, etc.); safety practices and procedures; state, federal, AASHTO, FHWA, and ASTM standards and project specifications; the Montana Materials manual; material specifications; testing equipment diagnosis and repair; project administration; supervisory principles and practices; collective bargaining agreements; training and professional development principles; and technical writing.

SKILLS:

This position requires skill in planning and coordinating materials testing projects; analyzing and interpreting technical test results; adapting testing methods and techniques to meet various material and project circumstances; and in operating a variety of testing equipment and general office equipment including a personal computer and associated business applications.

Minimum Qualifications (Education and Experience):

List the required education and experience required for the first day of work, including alternative methods of acquiring minimum qualifications

The required knowledge and skills are typically acquired through a combination of education and experience equivalent to Bachelor's Degree in Chemistry, Engineering, Physical, or Environmental Science, or a related field.

This position requires a minimum of 2 years of work related experience including, 1 year of progressively responsible experience in cement testing for highway and bridge construction and one 1 year progressively responsible experience in highway construction materials laboratory testing. Lab management experience is preferred. Experience testing the physical properties of Cement in a CCRL accredited lab is necessary to meet the cement testing requirement.

Alternatively, any combination of additional related work experience and education equivalent to the minimum qualifications, including 2 years progressively responsible experience in highway construction materials laboratory testing, with the ability to demonstrate proficiency in cement testing per ASTM C1222 within 90 calendar days from date of hire. Cement testing experience is preferred. Lab management experience is preferred.

Certifications, licensure, or other credentials include: Requires a valid driver's license. Requires obtaining ACI Strength Testing Technician Certification and WAQTC Concrete Field Testing Certification within 6 months of hire.

Special Requirements:

List any other special required information for this position

☐

Fingerprint check

☐

Valid driver's license

☐

Background check

☐

Other; Describe

Union Code

Safety Responsibilities

The specific statements shown in each section of this description are not intended to be all inclusive. They represent typical elements and criteria considered necessary to perform the job successfully.

Other information including working conditions such as shifts, lifting requirements, travel or hours:

The predominant work is performed in a controlled lab environment involving exposure to testing equipment, caustic chemicals (cement, lime, acids, mercury, and other chemicals), dust and fumes. The position works with hot materials and equipment (steel molds, ovens at 350 degrees, hot plates, etc.), and solvents and chemical additives which require use of protective apparel such as gloves, respirators, and eye protection. The position requires training in, and close observation of, safety practices and procedures.

Signatures

My signature below indicates the statements in the job description are accurate and complete.

Immediate Supervisor	Title	Date
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Administrative Review	Title	Date
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My signature below indicates that I have read this job description.

Employee	Title	Date
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Human Resources Review

Job Code Title: Materials Lab Specialist Job Code Number: 172715

Pay Band: 5

My signature below indicates that Human Resources has reviewed this job description for completeness and has made the following determinations:

☐ FLSA Exempt

☒ FLSA Non-Exempt

☐ Telework Available

☒ Telework Not Available

☒ Classification Complete

☐ Organizational Chart attached

Human Resources:

Renae Lang

Workforce Planning Manager

06/28/2018

Signature

Title

Date